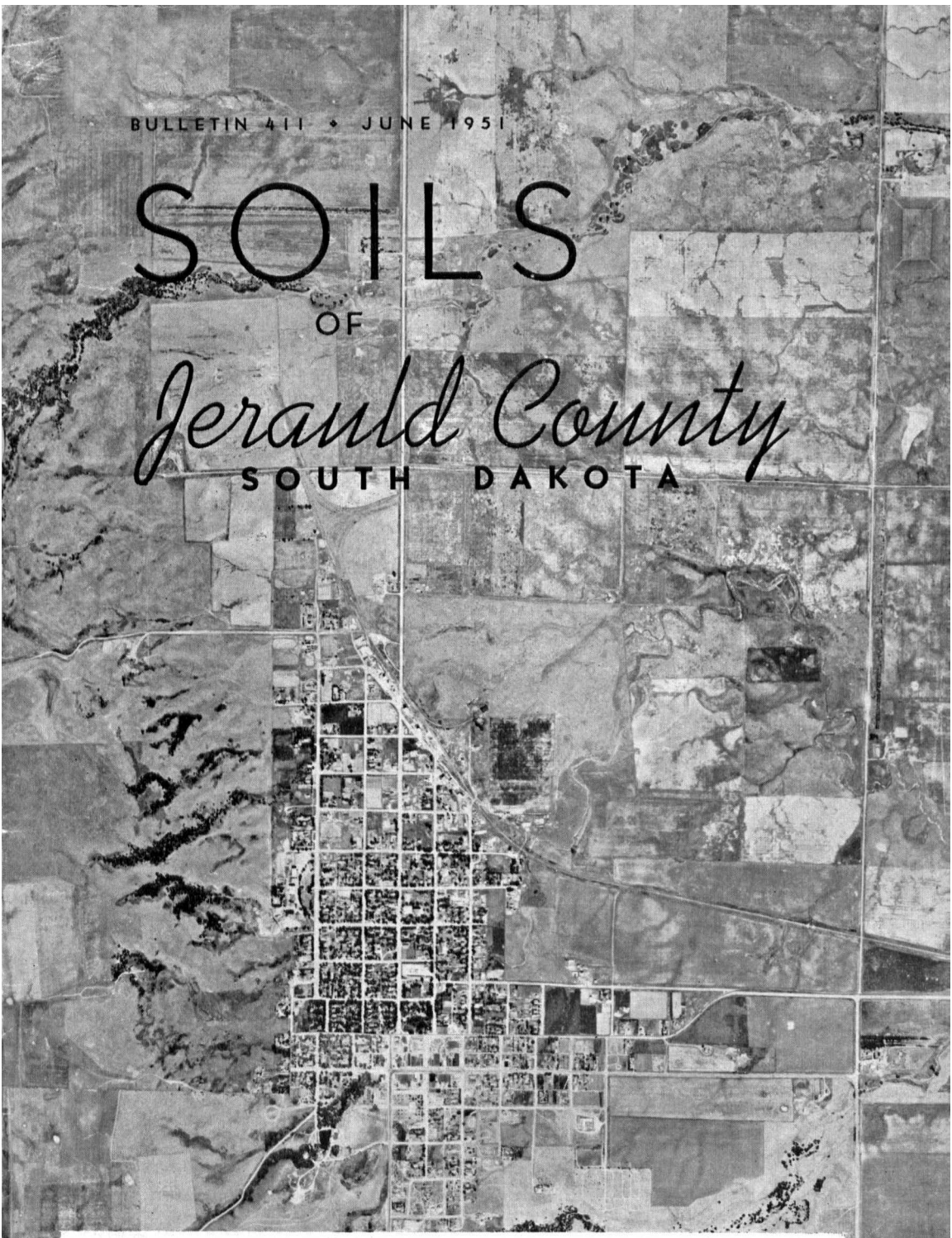
BULLETIN 411 • JUNE 1951

SOILS OF Jerauld County SOUTH DAKOTA



AGRONOMY DEPARTMENT **AGRICULTURAL EXPERIMENT STATION**
SOUTH DAKOTA STATE COLLEGE, BROOKINGS
IN COOPERATION WITH THE SOIL CONSERVATION SERVICE AND THE BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING, U. S. D. A.

Cover Picture

The cover picture shows how a small but typical area of Jerauld County looks from the air. The town appearing in the center is Wessington Springs. On the left (west) edge of town the Wessington Hills rise very abruptly. Intermingling of the light and darker colored areas indicates shadows and, to some extent, erosion which has occurred on these hills. At the base of these hills and to the right (east) lies a broad colluvial and alluvial plain. The fields shown in the picture are on Lane, Gann and associated soils in this area.

Cover courtesy of P.M.A., U.S.D.A.

Early History and Development of Jerauld County

Jerauld County was created by the territorial legislature in 1883 by slicing off parts of Buffalo and Aurora counties, the division being approved in a plebiscite. It was organized the same year and named in honor of H. A. Jerauld of Canton. In 1857 the first road built into South Dakota was called "Nobles Trail." It formed a route from Fort Ridgley, Minnesota to the site of Wessington Springs, and then southward to Fort Lookout on the Missouri. The first permanent settler in Jerauld County was Levi Hain, who built a log cabin at what was then called the Big Springs in 1876. Wessington Springs, the county seat, was plotted in 1881. Its location at the foot of Wessington Hills makes it the natural trade and shipping center of the county. There are two other towns in the county, namely Alpena and Lane.

Agriculture was, and still is, the principal enterprise of the county. The early settlers produced wheat almost exclusively. By 1900, because of the drought years, more attention was being turned towards stock raising as a more diversified system. The beginning of diversified farming in the 19th century marked the transition from the pioneer stage to the period of permanent farming in the county.

Early settlers were largely of Scandinavian descent, with Norwegians predominating. The 1950 census listed the population of Jerauld County at 4,459; of these, almost all are native born.

In 1950, 45 percent of the population lived in Wessington Springs, Alpena and Lane. Their respective populations were 1,450, 426, and 145. The remaining 55 percent of the population live on farms or in unincorporated settlements. Fifty-three percent of the people in the county depended directly on farming for a livelihood. This rural farm population had a density of 5.3 persons per square mile.

In 1940, 90 percent of the county was in farms, of which 50.7 percent was in cropland. There were 732 farms in the county with an average size of 417.8 acres. Of these, 103 were operated by full owners, 137 by part owners and 492 by managers and tenants. During the drought years of the 1930's the proportion of tenancy increased.

Schools. Jerauld County school system includes 37 rural schools, 3 town grade schools, 4 high schools and 1 parochial college. The Free Methodist College is located at Wessington Springs. Rural schools are available in all of the 15 civil townships in the county. Bus transportation is provided for pupils living at a considerable distance from schools.

Transportation. A branch line of the Chicago, Milwaukee and St. Paul Railroad enters Jerauld County from the east and ends at Wessington Springs. One federal and one state highway run through the county. State Highway No. 34 runs east and west through the center of the county, while Federal Highway No. 281 runs north and south and crosses No. 34 three miles east of Wessington Springs. There is an excellent system of county trunk highways and a network of lesser roads.

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Appendix

Soils of Jerauld County South Dakota

By A. J. KLINGELHOETS, V. W. MOXON, G. B. LEE, and G. J BUNTLEY[1]

This soil survey report has been written primarily for the farmers of Jerauld County, which is located in central South Dakota (See Fig. 2). Wessington Springs, the county seat, lies almost in the center of the county and is 41 miles by highway southwest of Huron, and 112 miles by highway southeast of Pierre.

The soil map in the folder attached to the back cover of this bulletin shows the distribution of different combinations or associations of the soils that occur in the county. In the text, recommendations as to use, management, and conservation are made in an attempt to answer the major questions of the farmers and others interested in the soils of Jerauld County.

What are the names of the soils? What slopes do they have? Are the soils stony? Are they salty? The answers to these and other questions may be found by first finding the land area in which one is interested on the map attached to the back cover of this bulletin. Then see what symbols are present in each of the areas. Comparison of these symbols with those in the list at the bottom of the map will tell what these numbers and letters mean.

What crop yields can be expected from these soils? This information is given in the yield data tables on pages 33, 34, 35 and 36.

What crop rotations and fertilizers will give the best results on these soils? See Table 1 dealing with this on pages 19 and 20.

What are the soils and subsoils like? See soil descriptions in body of report, page 19 to 32.

How much erosion has taken place in the county?

What soil and water saving practices are recommended? Read paragraph on page 19.

What kind of climate prevails? How does the land lie? What systems of farming are commonly followed?

These answers will be found in the section beginning on page 39.

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[1]Assistant agronomist; soil surveyor for the Soil Conservation Service, USDA; and assistant agronomists at the South Dakota Agricultural Experiment Station, respectively.

The field work for this survey was made by Vernon W. Moxon, USDA Soil Conservation Service, and completed in December 1945. The survey was inspected by C. A. Mogen, Division of Soil Survey, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA.

The following persons participated in the preparation of this map and report, in cooperation with the Bureau of Plant Industry, Soils, and Agricultural Engineering, and the Soil Conservation Service: F. C. Westin, D. I. Kettering and L. F. Puhr, of the South Dakota Agricultural Experiment Station, and G. A. Avery of the Soil Conservation Service.

Jerauld County and Its Farms

Jerauld County is rectangular in shape, 30 miles in length from east to west and 18 miles in width from north to south. It includes 15 townships and has a total area of 533.4 square miles or 341,402 acres. There are two lakes in the county. Cottonwood Lake lies just inside of the Jerauld County line in the northwestern corner, while Crow Lake lies in the southwestern part of the county. Firesteel Creek in the eastern part of the county is the largest stream and flows to the south. Sand Creek is in the northeastern corner and Morris Creek in the southeastern corner. Both flow southeast to the James River. In the western portion of the county, both Smith Creek and Crow Creek flow first to the south and then to the west to join the Missouri River.

Jerauld County is divided into two distinct sections by a range of hills called the Wessington Hills which extend from north to south in a crescent-shaped pattern. Figure 1 is a sketch or block diagram of landscape types in Jerauld County. That portion of the county to the east of these hills is called the lowland of the James River, while that portion including the hills and westward is referred to as the highland or Missouri Coteau. The Wessington Hills rise abruptly to a height of about 200 feet above the lowland plains to the east.

Jerauld County has been covered with a blanket of glacial till laid down over Pierre shale bedrock. The blanket of glacial till was laid down thousands of years ago, by an ice-sheet or glacier which covered the entire county. The underlying Pierre shale bedrock comes to the surface along some of the drainage ways in the deeper cuts. This shale bedrock is dark green in color in contrast to the yellow or olive-brown color of the glacial till. The till blanket is a mixture of clays, silts, sand, gravels and stones, while the Pierre shale, when weathered, is composed of finely divided particles.

Dust storms covered many areas of the Missouri Coteau with a blanket of flour-like silt a long time ago. It is believed that this blanket was laid down during a time when the eastern part of the county was again covered by an ice sheet which did not extend beyond the Wessington Hills. Kranzburg, Waubay, and other silty soils of this area were formed from this material.

The thickness of the glacial till blanket, laid down over the county, is not uniform. It may vary from none (where the Pierre shale bedrock is exposed) to many feet deep in other areas.

Wessington Hills, or the belt of hills extending north and south in a crescent shape just west of Wessington Springs, was built by a younger ice sheet which covered only the eastern section of the county.

This later ice sheet resulted in a younger blanket of glacial drift being laid down on the James River lowland than that which was laid down to the west beyond the Wessington Hills. The drift sheet on the James River lowlands, like that on the Missouri Coteau, is also underlain by Pierre shale. However, outcroppings, or exposed areas of the bedrock, in this eastern lowland are not as common as in the western highland. This may be due in part to the more level slopes or topography of the eastern lowland. The younger ice sheet, or Mankato as it is called, mixed up much more of the shale bedrock with the glacial drift during its advance over the eastern lowland. As a result, the till blanket over this area contains more shale, which

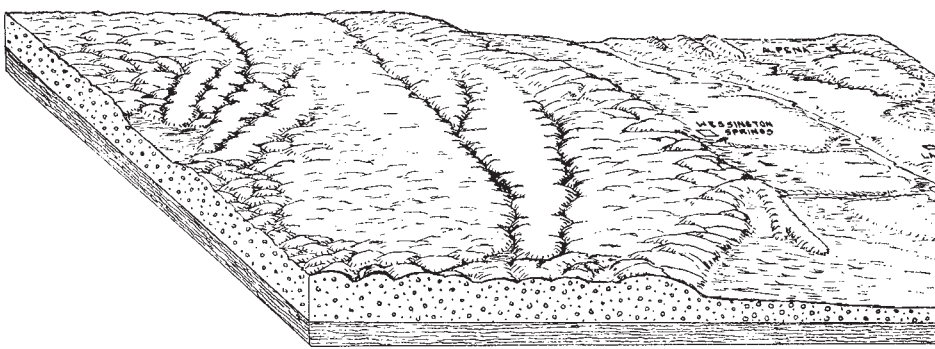


Fig. 1. Block diagram showing the landscape in Jerauld county. Note the prominent range of hills which oc
the county. These are the Wessington Hills. The soils in the county have developed from glacial drift, which
circles at the edges of the diagram. The horizontal lines below the glacial drift indicate a bedrock formation of

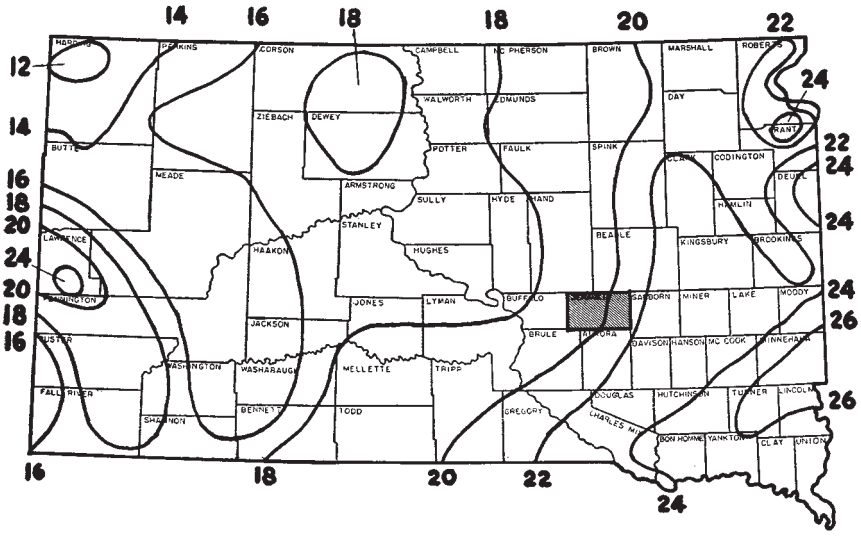


Fig. 2. Location and climate of Jerauld county (note shaded area). Annual precipitation ranges from 18 to 22 inches, and averages 19.37 inches.

makes it darker in color than the glacial till in the western section of Jerauld County.

Climate of Jerauld County

The climate of Jerauld County is typical of the dry sub-humid region of the Northern Great Plains. Wide variations in temperatures exist between winter and summer. The summers are hot and dry while the winters are very cold for short periods of time. Snow covers the ground throughout most winters, usually beginning in the latter part of November. A 10-year record at the Wessington Springs' weather station indicates the average date for the last killing frost in the spring is about May 8, and the first in the fall is September 26. This gives an average frost-free growing season of between 140 and 150 days for the county.

Just west of Jerauld County, at the Gann Valley weather station, the highest temperature recorded during the years 1905 through 1941 was 120° F and the lowest was –42° F. The average July temperature was 76.1° F, while the average January temperature was 16°.

The average annual precipitation in Jerauld County is 19.37 inches. More than half of this amount comes during the growing season.

Jerauld County climate is favorable for the production of small grains, row crops and forage crops. Lack of rainfall during the latter part of the growing season when the small grains have just started to mature makes their production hazardous in the drier years. This drought condition during the months of July and August is not favorable for growing corn for grain, except on the better soils which have larger moisture reserves to draw from. See Table 6 on weather data in Appendix.

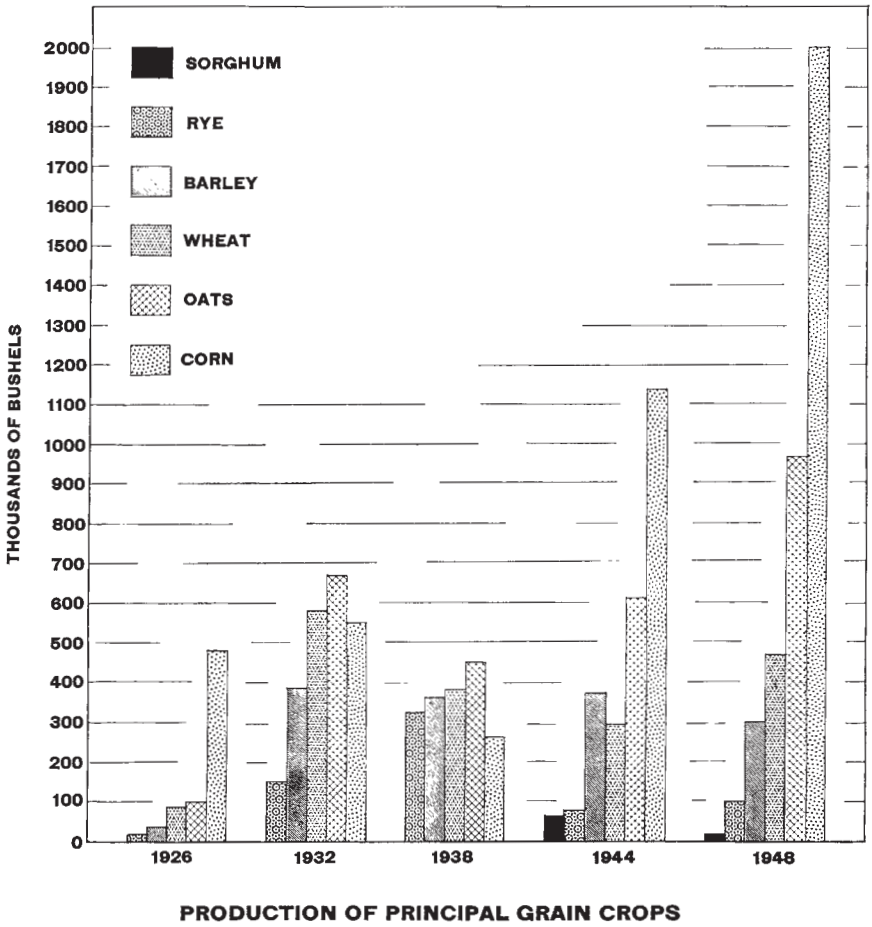


Fig. 3. Production of principal grain crops. Growing corn varieties which are more adapted to this area and more favorable weather conditions have enabled farmers to increase corn production in Jerauld county.

Agricultural Production in Jerauld County

The principal crops grown in Jerauld County in 1947, listed in order of importance by acreage, were as follows: wild hay, 140,000 acres; corn, 52,600 acres; all wheat (spring, winter, durum), 37,550 acres; oats, 30,100 acres; barley, 15,600 acres; rye harvested for grain, 6,800 acres; tame hay (75 percent alfalfa) 4,150 acres; sorghums (88 percent for forage) 3,600 acres; flax seed, 1,200 acres; potatoes 120 acres; alfalfa for seed, 50 acres.

The relatively high production of wild hay is due to the many depressional areas which are wet during parts of the year. These areas are not suitable for cultivation and are commonly used for the production of native grasses.

Farmers in Jerauld County derive their largest income from livestock and

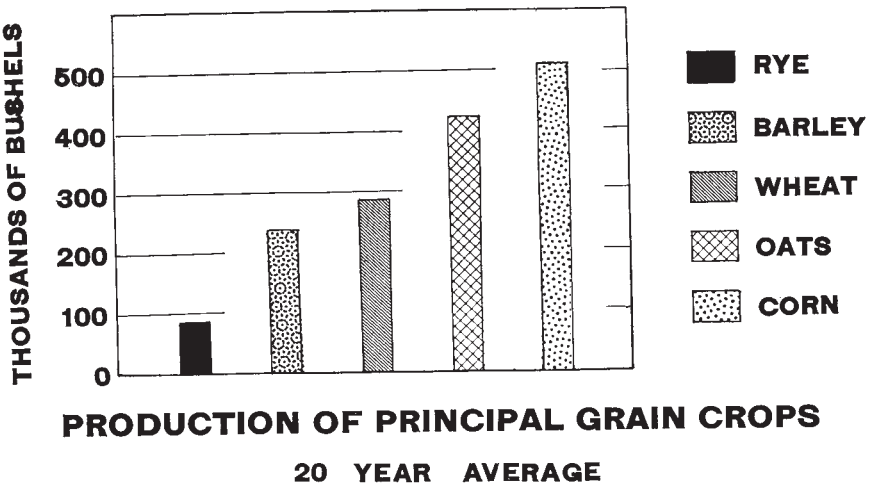


Fig. 4. A 20-year average of principal grain crops in the county indicates that corn production is highest and rye lowest.

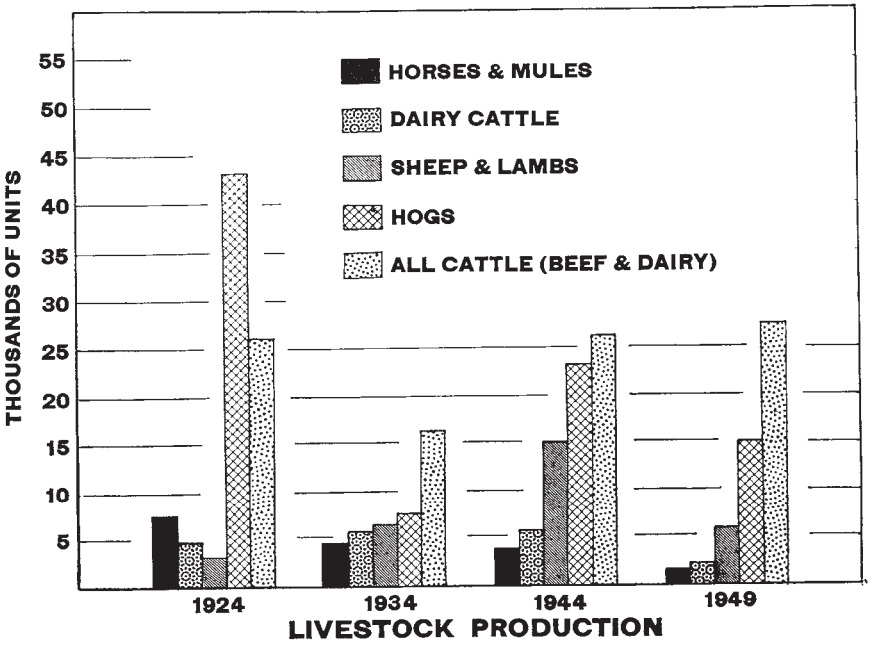


Fig. 5. Note the steady decline of horses, mules and hogs from 1924 to 1949.

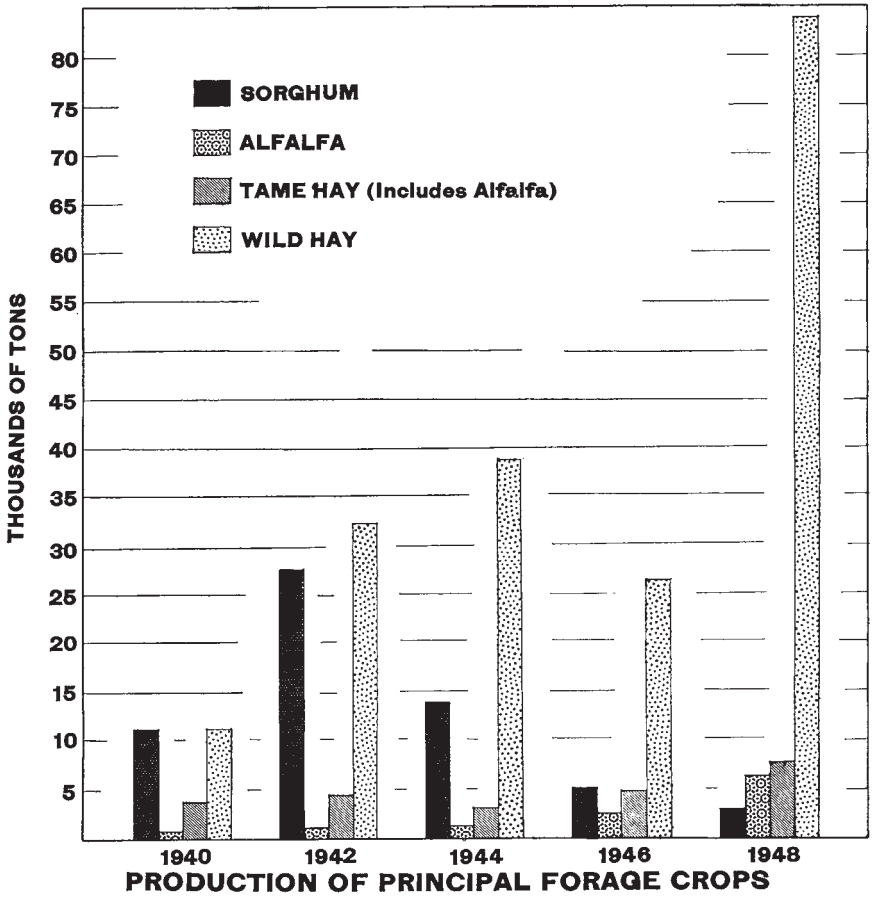


Fig. 6. The production of wild hay is very sporadic due to climatic conditions. In the wet years higher yields are obtained. In addition, more acreage is cut for hay than in the drier years.

livestock products. The sale of grain crops ranks second.

The livestock population on January 1, 1949 was as follows, listed in order of numbers of animals: Cattle, (11 percent milk cows and heifers) 27,400; hogs, 15,100; sheep and lambs, 6,300; horses and mules, 1,800.

Livestock populations on farms in Jerauld County have remained fairly uniform for the last 20 years with the exception of horses and mules. There has been a very rapid decrease in the number of these animals in the county.

Chickens are kept on nearly every farm, mainly for eggs. On January 1, 1949, there were 74,800 chickens on farms in Jerauld County.

Tables showing Agricultural Production are on pages 33, 34 and 36.

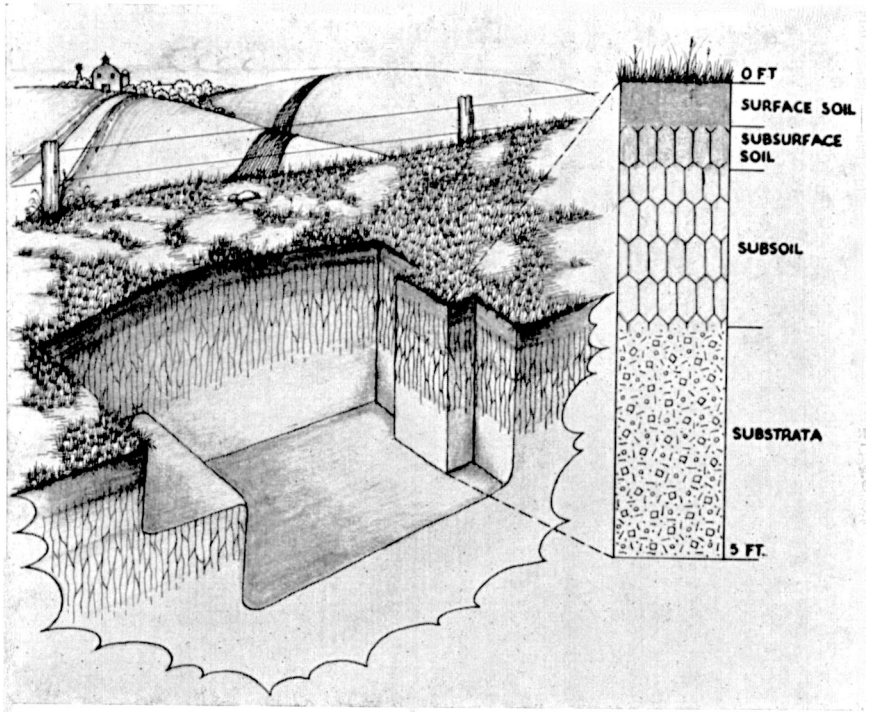


Fig. 7. Sketch of a major soil profile in the county showing the different layers or horizons which are found in the soil. This is a Barnes soil.

How To Know Your Soils

A fresh road cut or excavation is a good place to see what a soil is like. The picture above shows a soil profile of one of the major soil types found in the county.

A soil profile is a cross-section of a soil consisting of several layers or "horizons." In the case of Barnes soil, the following horizons are present:

1. Very dark brown or black surface soil.
2. Dark brown subsurface soil.
3. Brown subsoil.
4. Yellowish-brown, clay loam substratum.

Each soil type has a particular kind of profile. Different soils are separated on the basis of the character of layers or horizons that are within their profile, and not on the surface soil alone. The surface horizon of two soils may be identical, and yet the two soils may differ widely in agricultural value because of differences between one or more of the lower horizons. For example, the presence of a heavy claypan layer in one soil may result in much lower crop yields that would be obtained from a somewhat similar soil without the claypan or compacted horizon.

Soils differ from place to place. A

single farm unit may have several soil types present. A change from one soil type to another means that one or more of the layers in the soil profile has changed. A soil having a sandy surface may merge with a soil having a clayey surface. A well-drained soil may occur next to a soil having a claypan subsoil which would restrict drainage. Scabby spots and areas high in soluble salts are present in some places and not in others. The lay-of-the-land, or slope, varies from place to place. Stones are numerous in some areas and not in others.

These changes in the soil from place to place can only be determined by careful observation and use of a spade, post hole digger or soil auger in the examination of the soil below the surface. In Jerauld County, soil surveyors have determined thousands of soil profiles in this manner. Each time a change occurred in the surface soil or in a deeper horizon, a line was drawn on a map separating the two soils. These lines represent soil boundaries, and indicate where one kind of soil changes to another. These lines may also represent boundaries between different associations of soil types, and will separate slope and erosion phases of these associations.

What the Soil Map Shows

The soil map shows the location and boundaries of various soil types in the county. Typical topographic positions where some of major soil types in the county may be found are shown in Figs. 8 and 9.

In a survey of this kind, the soil surveyor did not have sufficient time to map all of the soils in great detail. Instead, associations of soil types, slope and erosion, and some soil complexes were mapped in this detailed soil association map of Jerauld County.

In the case of the more common soils, care has been taken to show their more important variations. It is important to understand that a soil type includes a range in characteristics. Also, within an area of a soil type there are often distinct areas of other types too small to be separated out on the soil map. These small areas have been included with the dominant soil types within a single boundary line on the map. Other soil types are so intermingled in very small areas that it is impossible to map them separately. These intermingled types have been grouped together and are called associations of two or more soil types.

Soil Names. Although soils are classified according to their profile characteristics, they are named after geographic places where they were first observed. An example is Jerauld silty clay loam which was named after Jerauld County. Another example is Kranzbury silty clay loam, named after the town of Kranzburg in Codington County, South Dakota, where the soil was first recognized and mapped. All of the other soils mapped in Jerauld County have also been named after places in either Jerauld County, or in other counties where these same soils had been mapped previously.

Soil Types. Individual kinds of soils are called "soil types." Just as Hereford cattle are called a beef breed or type, so is Barnes loam called a soil type. Two or more soil types can be distinguished from each other by the texture (fineness or coarseness) of the plow layer. For example, Barnes loam will have a coarser textured surface soil than Barnes silt loam. Types of soils, such as Jerauld silty clay loam, Fordville loam, and Buse loam are distinguished from one another by the characteristics of their profiles.

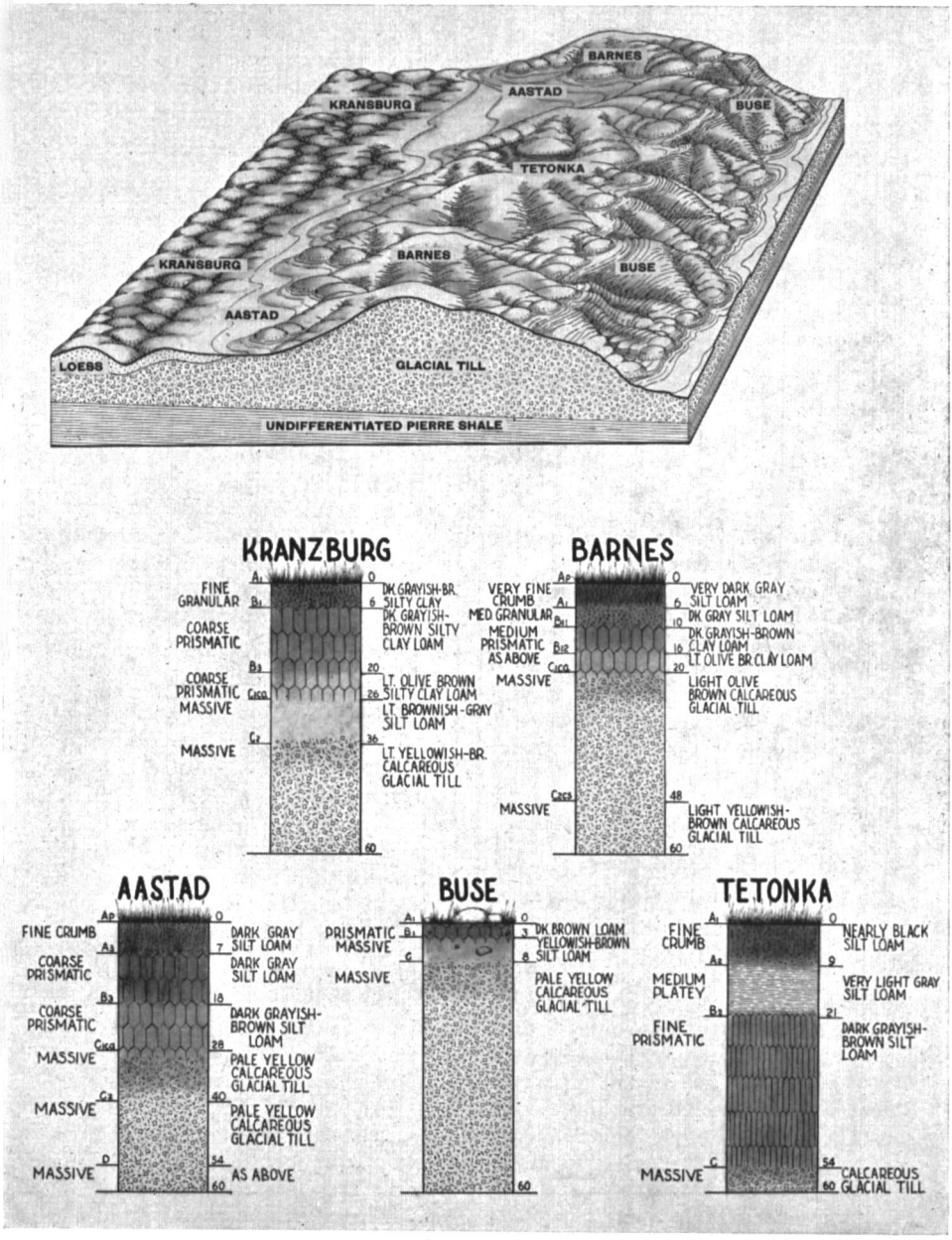


Fig. 8. Diagram showing the relative position of typical soils in the western part of Jerauld county.

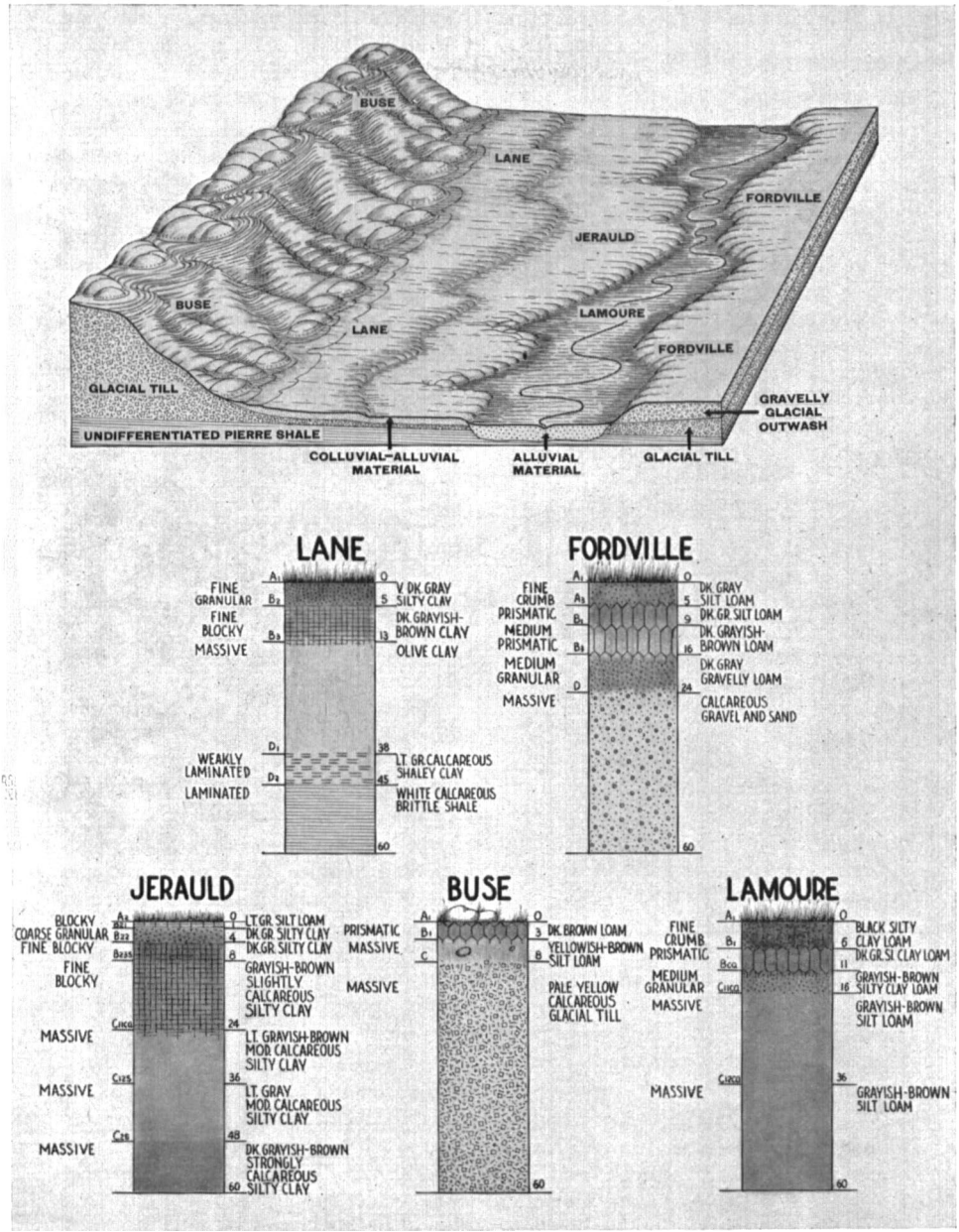


Fig. 9. Diagram showing the relative position of typical soils in the eastern part of Jerauld county.

Fordville loam has a gravel substratum, whereas Jerauld silty clay loam has a claypan subsoil, while the Buse soil type has neither of these characteristics.

Slope, Erosion. The soil map also shows slope and degree of erosion. The slope of the land is expressed as the number of feet in a hundred that the land falls. So a slope of 3 percent means three feet of fall for each hundred feet of distance. On the soil map of Jerauld County, level areas and slightly sloping land with slopes of 3 percent and less were grouped together as A slopes; 3 to 6 percent slopes are grouped under B; 6 to 9 percent slopes are grouped under BB; while 9 to 18 percent are grouped under C. Slopes of 18 percent or more are classed as D slopes. These letters appear in the map symbols following the numerical designation for soil type.

The erosion symbol indicates to what extent the surface soil has been removed by wind and water action. Three classes of erosion are recognized in the county. Where 25 percent or less of the surface soil or top soil has been removed, Class 1 erosion has been mapped. Where more than 25 percent and less than 75 percent of top soil has been eroded, Class 2 erosion is shown. Where 75 percent of the top soil and part of the subsoil has been removed by erosion, severe erosion, or Class 3, has been mapped.

How to Maintain Soils and Increase Crop Yields In Jerauld County

Satisfactory crop yields year after year are the result of good soil, good management and favorable weather conditions. Poor yields may be caused by a poor soil, by poor management, or by trying to grow crops that are not adapted to the area. Tables 2, 3, 4 and 5 in the Appendix of this report present estimated crop yields over a period of years on the various soils of Jerauld County.

Good soil management refers to such practices as a good choice and rotation of crops and adapted crop varieties, application of fertilizers or other amendments where needed, good tillage practices, and good weed and erosion control.

A rotation containing grasses and legumes should be used. It will provide organic matter and nitrogen, and will also make it possible to maintain better physical conditions in the lower horizons of the soil as well as in the surface. A deep-rooted legume such as sweet clover or alfalfa in the rotation will help prevent the development of this poor physical condition in the soil. Legumes in the rotation also aid in supplying the nitrogen and organic matter needed in order to obtain vigorous crop growth and crop yields. See Table 1 on pages 20-21 for suggested rotations.

Just as soils differ as to the crop yields they will produce, so will crop varieties vary as to the production they will make. Farmers in Jerauld County will do better with adapted crop varieties for their particular area. Yields of hybrid corn versus open-pollinated varieties are an example of this.

Soil tests are a valuable aid in determining what a soil needs. Some soils in Jerauld County need commercial fertilizers while others may not. Soil tests and the soil map together will help decide where application of fertilizers should be made and in what amounts. Good results may be obtained by following the suggested applications of commercial fertilizer given in Table 1.

Barnyard manure is another valuable source of plant nutrients and organic matter. Maximum benefits are obtained by spreading it on the corn land the second time that corn occurs in the rotation. Returning crop residues to the soil and the plowing under of sweet clover or alfalfa, and grasses are highly desirable as a means of maintaining the fertility and organic matter content of the soils.

Good tillage practices apply to all soils that are plowed and cropped. They help to incorporate crop residue and manure with the soil, encourage soil aeration, provide the satisfactory seed beds so essential for the establishment of good stands of crops, help protect the soil against erosion and aid in conserving moisture, mainly by controlling weeds.

Finer textured soils like clay loams are likely to puddle if plowed when wet, while coarser textured soils like Fordville loam are subject to wind erosion when worked during dry weather. Clay loams and other fine textured soils should be plowed and worked when the soil is at its proper moisture content. Coarser textured soils, particularly those which are more subject to wind erosion, should be left with a rough surface or with a covering of crop residue on the surface when tilled.

Protection Against Erosion. Good soil management must also include protection from soil erosion. Special water-control practices are needed in some areas of the county to prevent destructive erosion. Other areas are so steep that permanent hay or pasture is the only solution to erosion control. Wind erosion control practices are also needed on some of the soils in Jerauld County.

One of the principal aids in erosion control is the selection of a crop rotation including one to four years of hay or pasture. Other soil conservation practices, such as using crop residues and fertilizers to maintain the organic matter and fertility, and protecting the soil with a vegetative covering as much of the time as practicable, will help to give satisfactory control. Additional practices such as grass waterways, strip cropping and terracing on sloping land, cultivation on the contour, and other conservation practices will be needed on some soil types. More detailed directions and technical aid for controlling erosion on individual farms in the county may be obtained by contacting the county extension agent or the Soil Conservation Service.

Soils and Soil Associations of Jerauld County

The nature of individual soil and soil associations in Jerauld County is determined by the lay-of-the-land, the kinds of materials from which the soils were formed, the climate, and the types of vegetation or grasses which originally grew in the area.

A classification of the soils according to parent materials, lay-of-the-land, drainage, resistance to drought, and tendency to erode is given in Table 7 in the Appendix.

There are several ways of grouping soils in any particular county. In Jerauld County the soils have been grouped on the basis of their overall agricultural value, suitability for irrigation, and restrictions upon land use due to limiting factors such as erosion and drainage. At the present time, irrigation farming in the county is not practiced to any extent. In the future, however, some areas of the county may be placed under an irrigation type of farming. This would re-

Table 1. Suggested Crop Rotations and Fertilizer Applications for Use on the Soils of Je

Names of soil groups* and soils	Rotations†	Fertilizer Appl		
		Corn	Wheat Oats Barley	Rye
First Class Soils Barnes and Aastad silt loams and loams Barnes silt loam and loam Barnes silt loam and Kranzburg silty clay loam Barnes silt loam and Kranzburg and Waubay silty clay loams Gann silt loam Kranzburg silty clay loam Kranzburg and Waubay silty clay loams Lane silty clay loam	S. Clo.-Corn-Sm. G.-Corn-Sm. G. and return of crop residues to the soil. or Alf.-Alf.-Alf.-Alf.-Corn-Sm. G.-Corn-Sm. G. or Alf. Br.-Alf. Br.-Alf.§ Br.-Alf. Br.-Corn-Sm. G. -Corn-Sm. G.	Barnyard manure	Add 100 lbs. 16-20-0 with the drill at time of planting	Top dres spring with lbs. 32-((Ammoni nitrate
Second Class Soils Fordville loam and silt loam Fordville and Kranzburg loams and silt loams Lane-Jerauld silty clay loams	Alf.-Alf.-Alf.-Alf.-Sorghum-Sm. G.-Sorghum‖ -Sm. G. or S. Clo.-Sorghum-Sm. G. or Alf. Br.-Alf. Br.-Pasture-Pasture-Sorghum-Sm. G. -Sorghum-Sm. G.§	Barnyard manure	Same as above	Same as a
Lamoure silt loam	Alf.-Alf.-Alf.-Alf.-Corn-Sm. G.-Corn-Sm. G.	Barnyard manure		
Lane clay (shale substratum)	S. Clo.-Sorghum-Sm. G.‖	Barnyard manure	Add 100 lbs. 0-43-0 with the drill at time of planting	

Names of soil groups* and soils	Rotations†	Fertilizer Appl		
		Corn	Wheat Oats Barley	Rye
Third Class Soils	Permanent tame hay or pasture	Barnyard manure		
Jerauld-Lane silty clay loams				
Lamour silty clay loam				
Sioux and Fordville loams				
Fourth Class Soils	Permanent tame or native pasture		No recommendations	
Buse loam and stony loam				
Benoit loams and silt loams	Permanent tame hay or pasture			
Jerauld silty clay loam	Permanent native pasture			
Tetonka and Parnell silt loams and silty clay				
Rauville silty clay loam				

*Since many of the soils in the county occur in such close association that it would be impossible to separate and treat ea
in the table above have been made for soil associations.
†Key to abbreviations: S. Clo. = Sweet Clover, Sm.G = Small Grains, Alf. = Alfalfa, Alf.Br. = Alfalfa-Brome.
‡Plowing under sweet clover hay and other legumes is a highly desirable method of returning organic matter and nitrogen
§Ree wheatgrass or crested wheatgrass may be substituted in rotations in place of bromegrass, if desired.
¶The suggested applications of 0-43-0 may be applied to established stands of alfalfa as a top dressing.
‖Corn may be substituted in the rotation in place of sorghum.

quire some revision in the grouping of the soils. For example, a soil may be good for dry-land wheat farming but unsuitable for irrigation because of poor internal drainage.

Soils grouped on the basis of general agricultural value have been divided into four classes: (1) good farm land, (2) fair farm land, (3) poor farm land, and (4) land suited only for the grazing of livestock or for wild life and recreation. See index of soil and soil associations Table 8 in Appendix.

Soils grouped on the basis of suitability for irrigation were divided into three classes: (1) soils suitable for irrigation, (2) soils which may or may not be suitable depending on the results of further studies, and (3) soils which are not suitable for an irrigation type of farming. See index of soils, and soil associations in regard to irrigation, Table 9 in Appendix of report.

A third basis for separation or grouping of soils in this area is that of proper land use according to its capabilities. Groupings based on the limitations and hazards of farming of the soils in this area consist of: (1) Good land subject to moderate limitations, (2) Fair land subject to severe limitations, (3) Poor land subject to severe limitations and suitable only for occasional cultivation, (4) Land not suited for cultivation because of wetness and flooding hazard, (5) Land suited only for grazing or permanent hay, (6) Land suited for limited or controlled grazing, and (7) Extremely wet or swampy areas best suited for watersheds and wildlife but which may provide limited grazing. Groupings of soils under land-use capabilities may be found in Table 8 in the Appendix.

FIRST CLASS SOILS

(Good Farm Land)

First class soils are the best agricultural soils in the county. They occupy level to gently sloping or undulating land areas. They are medium-textured soils of good water-holding capacity for normal crop production. Drainage is good, both on the surface and down through the soil. There are no serious limitations to cultivation and crop production such as stones, or excess soluble salts.

Barnes and Aastad Silt Loams and Loams (Bl Al)

Where the Barnes and Aastad soils were so intermingled that it was impossible to separate them on the map they were mapped together as an association. Barnes soils comprise by far the largest percent of this association. More than 9.4 percent of Jerauld County, or 32,135 acres of this association, has been mapped. The use and management of these soils is the same as that discussed under the respective series.

East of the Wessington Hills, Barnes and Aastad loams will predominate in this association. West of the Hills, the soils are more silty in nature, and Barnes and Aastad silt loams will predominate, with loams being in the minority.

Barnes Silt Loam and Loam (B and Bl)

Barnes loam and silt loam are included in this discussion. This is an upland soil developed over a clay loam glacial till substratum. It ranges in depth from 18 to 24 inches and in some areas has been influenced by the addition of silt materials deposited by wind action. Although some areas of this soil occur on slopes too steep for cultivation, the major portion of the Barnes is classed as good farm land. Approximately 28.9 percent of the county, or 98,751 acres of Barnes, has been mapped.

Surface Soil and Subsoil. Barnes loam is characterized by a 5- to 10-inch,

very dark brown surface soil. The dark color in the surface is due to accumulated organic matter. Below this is a dark brown friable loam, usually 6 to 10 inches thick. The next layer consists of an olive-brown, compact, gritty loam, some 5 to 8 inches in thickness. The substratum is a light yellowish-brown to light olive-brown, gritty clay loam. Spots and streaks of lime are present in the substratum. Small pebbles are scattered through this soil.

Use and Management. Barnes soil is the most predominant soil under cultivation in Jerauld County. Farmers on Barnes soil are concerned mainly with the production of small grains, corn and forage crops. Yields are moderate to good.

The more level areas of Barnes east of Wessington Hills may be suitable for an irrigation type of farming. West of the Hills, on the Missouri Coteau, cost of providing irrigation water may determine whether or not these soils can be irrigated profitably. Feasibility of irrigation may be ruled out in both areas if subsurface drainage is not favorable, or if large numbers of stones are present in the soil profile.

Some areas are fairly stony, and in many cases it has been necessary to remove the stones so they do not interfere with tillage operations.

The Barnes soil is a relatively thin soil and retention of all of the top soil is essential for continued high production. Wind erosion, during the dry "30's" caused severe damage in some areas where fields were left without vegetative cover. On steeper slopes, water erosion has also removed some of the fertile topsoil. Simple conservation practices will prevent serious damage from erosion on much of the Barnes soil.

West of the Wessington Hills, the Barnes soil will be dominantly silt loam in texture; east of these hills, Barnes loam will predominate.

Aastad Silt Loam and Loam (A andAl)

Aastad silt loam is an upland soil developed over a clay loam glacial till substratum. It is closely associated with the Barnes soils, occurring in the lower lying areas and on flat slopes. All of this soil in Jerauld County has been mapped in association with the Barnes soils. No separation of the acreage as to the proportion of each soil in the association has been made.

Surface Soil and Subsoil. Aastad silt loam is characterized by a deep, dark gray surface soil ranging from 10 to 18 inches in thickness. The subsoil is dark grayish-brown in color, and from 12 to 24 inches thick. The substratum consists of a light yellowish-brown to light olive-brown, gritty clay loam with spots and streaks of lime.

Use and Management. Aastad silt loam is one of the better soils in Jerauld County. Good yields of small grains, corn and forages are obtained. This soil is moderately well-drained and has the optimum or best moisture holding capacity for soils in this area. As a result, crops on Aastad silt loam do not show the effects of a drought as quickly as on some of the well-drained soils in Jerauld County.

Because natural drainage is somewhat restricted in this soil, it is doubtful if the Aastad silt loam could be successfully irrigated. However, further examination of the soil, such as permeability tests, would have to be made before a decision could be given.

Erosion by water has resulted in the loss of some topsoil on the Aastad silt loam. This is especially true where the runoff from the slopes above has concentrated on this soil. Wind erosion has

also resulted in the loss of some topsoil. Simple conservation practices on this soil will prevent any serious damage in most cases.

Gann Silt Loam (G)

Gann silt loam has developed in dark topsoil sediments washed down from the adjacent uplands and overlies clay loam glacial till. It occurs in relatively small areas along small stream valleys between the uplands and bottom lands on colluvial-alluvial fans. There are only about 3,353 acres of this soil, comprising about 1 percent of the total area of the county.

Surface Soil and Subsoil. Twelve to sixteen inches of dark gray to very dark gray, grading into a dark grayish-brown material, characterize the Gann surface soil. The subsoil is 18 to 30 inches thick, and is dark grayish-brown in color grading into brown with depth. Below 30 to 50 inches, an olive-gray to olive-brown calcareous clay loam, reworked glacial till substratum is found. Glacial sand and gravel are commonly found scattered throughout the substratum.

Use and Management. Gann soils are among the most desirable farming soils of the county. Relatively high yields of small grains, corn and alfalfa are obtained. The more level land areas of this soil are suitable for an irrigation type of farming.

Although this soil occurs on level to sloping land, it is subject to severe erosion. Large quantities of runoff from steep land above and adjacent to the Gann have caused severe gullying in many places. The construction of diversion ditches and terraces and the seeding of grass in waterways are the most important practices for controlling erosion and maintaining the continued high production of these soils.

Barnes Silt Loam and Kranzburg Silty Clay Loam (BK)

This soil association occurs on undulating to rolling topography west of Wessington Hills. About 4.1 percent of the county, or 14,139 acres of this association, has been mapped.

The soils in this association which occur on the steeper slopes are no different in respect to profile development than the same soils on more gentle slopes. These soils, however, are more subject to the hazards of water erosion and special care must be exercised to prevent the loss of top soil and a resulting loss in productivity.

Kranzburg Silty Clay Loam (K)

Kranzburg silty clay loam is an upland soil, developed from a blanket of wind-blown materials, over a clay loam glacial till substratum. Almost all of this soil type in the county falls into the grouping of first class soils. Most of the Kranzburg mapped in Jerauld County has been mapped in associations with other soils. However, almost 0.5 percent, or 1,653 acres, of Kranzburg silty clay loam has been separated out.

Surface Soil and Subsoil. Kranzburg silty clay loam is characterized by 6 to 10 inches of dark grayish-brown surface soil. The subsoil is dark grayish-brown in the upper part, grading to grayish-brown in the lower portion. It ranges in thickness from 12 to 18 inches and is often strongly calcareous in the lower portion.

Use and Management. Kranzburg soils occur in close association with the more level Barnes soils throughout most of the county. Their use and management is almost identical with that of the Barnes. Small grains, corn, and forages are the major crops, and moderate to good yields are obtained.

An irrigation system of farming may be feasible on this soil type if further investigations show that it has adequate subsurface drainage. All of this soil occurs in the western half of the county on the Missouri Coteau. Cost of providing irrigation water may determine whether these soils can be irrigated profitably.

Lack of stones in the upper portion of the profile and slightly greater depth to the substratum make this a better soil than the Barnes. Lack of vegetative cover, and improper farming methods have resulted in serious damage in some areas from both wind and water erosion. Erosion control measures on the Kranzburg soil will help prevent further loss of fertile top soil.

Kranzburg and Waubay Silty Clay Loams (K W)

Where the Kranzburg and Waubay soils were so intermingled that it was impossible to separate the two in a survey of this kind, they were mapped together as an association. The use and management of the soils in this association will be the same as that discussed under the respective series. All of this association occurs in the western half of the county on the Missouri Coteau. Only 0.5 percent, or 1,743 acres, of this association has been mapped in the county.

Waubay Silty Clay Loam (W)

Waubay silty clay loam is an upland soil developed over a clay loam glacial till substratum. Waubay is a moderately well-drained associate of the Kranzburg series and occupies the lower lying areas and more level slopes. All of the Waubay silty clay loam in Jerauld County is included under the heading of first class soils. No acreage of this soil has been separated out from the association in which it occurs.

Surface Soil and Subsoil. Waubay silty clay loam is characterized by a deep, dark gray to black surface soil ranging from 12 to 20 inches in depth. The subsoil is very dark grayish-brown in color and from 14 to 28 inches deep. The subsoil may be calcareous in the lower portion. The substratum consists of a light yellowish-brown to light olive-brown, gritty clay loam with spots and streaks of lime.

Use and Management. This soil is one of the better soils in Jerauld County. Good yields of all crops common to the area are obtained. The fact that this soil is moderately well-drained gives it the optimum moisture holding capacity for soils in this region. As a result, crops on this soil do not show the effects of a drought as quickly as on some of the well-drained soils in Jerauld County. Since the natural drainage of this soil is already somewhat restricted, it is doubtful whether additional water in the form of irrigation could be applied without harmful results. Further studies, such as permeability tests, will have to be made before feasibility of irrigation on this soil can be determined.

Erosion is not too serious a problem on this soil. Where runoff from steeper slopes above has concentrated on this soil, some erosion has occurred. Simple conservation practices on this soil will prevent any serious damage in most cases.

Barnes Silt Loam and Kranzburg and Waubay Silty Clay Loams (BKW)

This soil association occurs on the undulating uplands west of Wessington Hills. Use and management practices are identical with those given in the discussion under the respective soil series. Approximately 36,121 acres, or 10.6 percent of the county, have been placed in this association.

Lane Silty Clay Loam (Ln)

Lane silt loam and silty clay loam are included under this heading. Lane silty clay loam has developed in local materials on lesser slopes (colluvial-alluvial) from glacial drift or till. Typically, it occurs on nearly level, broad alluvial fans below the steeply sloping upland breaks. Wessington Springs, at the foot of Wessington Hills, is located on this soil. Approximately 5.6 percent of the county, or 19,006 acres of this soil type, was mapped.

Surface Soil and Subsoil. Lane silty clay loam is characterized by 12 to 18 inches of very dark gray to black surface soil. The subsoil is dark grayish-brown, and ranges in thickness from 20 to 40 inches. Normally, no free lime occurs above a depth of 40 inches in this soil.

Use and Management. Lane silty clay loam is a very productive soil. Moderate to good yields of all crops commonly grown in the county are obtained.

Although this soil occurs on level to gently sloping land, erosion by both wind and water has been extensive in some areas. The most damaging type of erosion has been caused by concentration of water from the rough land above. Failure to provide suitable waterways for disposing of these concentrations of water has resulted in severe gullying. Erosion control measures are a prime requisite if these soils are going to continue at their present productive level.

An irrigation type of farming may be feasible on this soil if further investigation shows that it possesses adequate internal drainage. In the soil survey of Jerauld County no separations were made based on the permeability of the substratum or underlying materials.

SECOND CLASS SOILS

(Fair to Good Farm Land)

The soils in this class rate somewhat lower than those in first class because of droughtiness, poor drainage, or some other limiting factor that results in reduced crop yields or limits their use capabilities somewhat. With good treatment, some second class soils can be brought to a level of productivity comparable with first class soils. Some improvements plus skillful management are needed to produce these results. In the main, these soils will produce good yields when well managed but only fair yields under poor management and without improvements.

Fordville and Kranzburg Loams and Silt Loams (F K)

This association occurs on high, nearly level flats west of the Wessington Hills. The profile characteristics are the same as those discussed under the respective series. Fordville soils predominate in this association. Both of these soils are easily tilled and moderate to good yields of all crops common to the area are obtained. Almost 1 percent, or 3,295 acres, of this association has been mapped in the county. Some of the better areas of this association, where the Fordville soils are relatively deep over gravel and larger proportions of Kranzburg occur, may be rated as first class soils. In most cases, however, this association will fall into second class soils, owing to the shallowness to gravel and droughtiness of the Fordville soil which is the dominant soil in this association.

Both the Fordville and Kranzburg soils in this association may be suitable for irrigation farming. Feasibility of irrigation on these soils will depend primarily on the feasibility of raising water up to the level at which these soils occur.

In the case of Kranzburg silt loam, permeability of the substratum will also be a factor to take into consideration before considering irrigation.

Wind erosion has resulted in the loss of some top soil from these soils. Leaving crop residues on the surface as much of the time as possible will help prevent serious damage from wind erosion. Crop residue or other forms of organic matter will also help to conserve moisture. Since the Fordville soil in this association tends to be droughty, moisture conserving practices will help to maintain the productivity.

Fordville Loam and Silt Loam (F)

Both Fordville loam and silt loam are included in this discussion of Fordville. This soil has developed in 18 to 36 inches of sediments resting on sand and gravel. It occurs on terrace and outwash flats along the major streams and drainage channels. Its total area in the county is relatively small. About 1.8 percent, or 6,005 acres of Fordville soils, has been separated out from other soils and associations in the county.

Surface Soil and Subsoil. The surface soil of Fordville loam or silt loam is characterized by a very dark brown layer, 5 to 10 inches thick. The upper subsoil ranges from 8 to 16 inches in depth and is dark yellowish-brown in color. A light yellowish-brown layer 5 to 14 inches deep, with some gravel mixed in, comprises the lower subsoil. This is underlain by a substratum comprised of layers of gravel, or gravel and sand mixtures extending to a depth of several feet.

Use and Management. Fordville soils occur on nearly level to gently undulating slopes and are easily tilled. Moderate yields of all crops grown in the area are obtained. This soil is rated as a Class 2 agricultural soil, because its moderate depth to gravel and sand makes it somewhat droughty. Drainage is good to excessive in this soil, and since there are no other limitations to irrigation, Fordville appears to be one of the best suited soils in the area for irrigation farming.

Both soil and moisture conserving practices are necesary in the best management of Fordville loam and silt loam under a dry-land system of farming. Since this soil tends to be droughty, moisture conserving practices which will allow for the storage of the maximum amount of moisture for the next growing season should be used. Wind erosion is a problem, and care must be taken to maintain a cover of crop residue on the surface as much of the time as possible.

Lamoure Silt Loam (L)

Lamoure silt loam is a somewhat poorly drained soil found on the higher bottoms along stream courses. It has developed from sediments left by periodic flood waters. This soil varies considerably in depth and in the character of the underlying material. Approximately 2.4 percent of the county, or 8,037 acres of this Class 2 soil, has been mapped.

Surface Soil and Subsoil. Lamoure silt loam is characterized by 6 to 18 inches of nearly black surface soil. The subsoil layer ranges in depth from one to three feet or more, is highly calcareous, and very dark colored with spots and streaks of gray and rust scattered throughout. The spots of gray and rust are a result of poor drainage or a high water table in the profile.

Use and Management. Because of spring flood hazards and slow drainage, this soil falls into the Class 2 soils of the county. Although it is slow to dry out in the spring, Lamoure silt loam is suitable for occasional cultivation, with forages and corn being the principal crops

grown. However, where only a small part of the farm is Lamoure silt loam, that area is generally left in grass.

Because of its poor subsoil drainage, this soil is not considered suitable for irrigation. Erosion is seldom a major problem on this soil. In some bottoms, active streams may cut new channels through these soils during flood stage. In these bottoms, stream erosion does constitute a major problem. In other cases protection from flooding may require special practices. Technical assistance from the county agent or the Soil Conservation Service should be secured in either case if special practices are needed.

Lane Clay (Shale Substratum) (Lc)

Lane clay (shale substratum) occurs in only one small area in Jerauld County. Approximately 438 acres of this soil type have been separated out in the northeast corner of Crow Township. This soil has developed in local clay alluvial-colluvial materials over shale. It occurs on broad alluvial fans below steeply sloping upland breaks.

Surface Soil and Subsoil. Lane clay is characterized by 5 inches of dark gray to black silty clay surface soil. The upper subsoil is dark grayish-brown in color and 5 to 8 inches thick. The lower portion of the subsoil is olive in color and 20 to 25 inches thick. This lower portion of the subsoil may contain free lime. The substratum consists of light gray to white, shaly clay and brittle shale.

Use and Management. Lane clay is not as productive a soil as its silty clay loam associate. Fair yields of corn and moderate yields of small grains and forages are produced. It is best suited for the production of small grains and forages. Lane clay is harder to work and more care must be exercised in its cultivation to prevent unfavorable physical conditions from developing such as compaction of the surface.

Lane clay has been classed as unsuitable for irrigation, because of the fine texture of the entire profile. The clayey shales below would further restrict movement of additional water through the profile.

As is the case with Lane silty clay loam, extensive erosion has been caused on this soil by concentration of water from the rough land above. Disposing of these concentrations by providing suitable water ways is of major importance in conserving the top soil on the Lane clay.

Lane-Jerauld Silty Clay Loams (Ln J)

Where the Lane and Jerauld silty clay loams were so intermingled that it was not possible to separate the two, they were mapped together as a complex. In this complex, Lane is the dominating soil but small scattered areas of Jerauld are included. Crops growing on these soils will indicate where the Jerauld soils occur in this complex by their poorer growth.

The profile characteristics of the two soils in this complex are the same as those discussed under the respective series. Use and management of this complex will range between that given for each of the soils in the complex but will be closer to that discussed under the Lane silty clay loam. Approximately 3.4 percent, or 11,766 acres, of this complex has been separated out in Jerauld County.

THIRD CLASS SOILS

(Poor Farm Land)

The soils in this class have been rated lower than the second class soils because of poor drainage, droughtiness, and soluble salts or claypan development. Improvement of these soils for tillage is seldom economical. Some of these soils

such as Sioux loam are cultivated, but normal yields are very low. Usually these cultivated areas are small and occur in close association with better soils. The poorly drained soils in this class are almost entirely devoted to permanent pasture and native forage production.

Jerauld-Lane Silty Clay Loams (J Ln)

This complex is essentially the same as the Lane-Jerauld complex, with the exception that Jerauld silty clay loam is the dominating soil instead of Lane. Differential plant growth on this complex will be very apparent. Many so-called scabby or slick spots will occur in this complex.

Use and management, while still bordering between that discussed for the Lane and Jerauld soils under their respective series, will be closer to that indicated for the Jerauld silty clay loam. About 1 percent of the county, or 3,376 acres of this complex, has been mapped in the county.

Lamoure Silty Clay Loam (La)

Both Lamoure silty clay loam and silty clay are included in this discussion. These soils are found along drainage channels and are first bottom soils. They are subject to periodic flooding during most of the year. Lamoure silty clay loam is a very wet associate of the better drained Lamoure silt loam. The largest area of this soil lies in the Firesteel Creek bottom. Other areas occur throughout the county in drainage channels but are not nearly as extensive. The total acreage in the county is around 12,255 acres.

Surface Soil and Subsoil. Lamoure silty clay loam has a shallow surface soil ranging from 4 to 6 inches in depth. It is dark gray to black in color. The upper portion of the subsoil is gray to dark grayish-brown in color, moderately calcareous, and ranges in thickness from 8 to 12 inches. This grades into a dark grayish-brown and white layer about 15 inches thick. Spots and flecks of soluble salts occur in this layer. The upper part of the substratum is light grayish-brown in color and may contain scattered gravels. Below 40 inches the substratum may be extremely variable. It may contain strata or layers of gravels, sand, silts and clays. Spots and streaks of gray and brown are scattered throughout the profile. These spots or mottles are a result of poor drainage or a high water table in the Lamoure silty clay loam.

Use and Management. Since these areas are periodically flooded, they are used almost entirely for native hay and permanent pasture. There is little or no erosion on these soils except that caused by streams cutting new channels during flood stage.

Sioux and Fordville Loams (S F)

In the Sioux and Fordville association, Sioux loam predominates. Small areas of the deeper Fordville soils occur in close association with the Sioux, and it was not possible in a survey of this kind to separate the two. These soils are found along the major streams and drainage channels on terrace or outwash flats. A little over 1.6 percent of the county, or 5,538 acres of this association, has been mapped.

Profile characteristics of the soils in this association are the same as those discussed under the respective series descriptions. Use and management of this association is very similar to that for the Sioux. The over-all droughtiness of the soils and the low percentage of the deeper Fordville in this association limit its productivity. These soils may be best suited for the production of pasture and forages.

Sioux Loam (S)

Sioux loam is a shallow soil developed over sands and gravels on stream terraces or outwash flats. It is quite similar to the Fordville soils but has a shallower profile. Sioux soils have been mapped where the gravel and sand substratum occurs less than 18 inches from the surface. In Jerauld County all of the Sioux loam has been mapped in an association with Fordville soils. Acreage and proportional extent of Sioux loam in the county has not been separated out from the association.

Surface Soil and Subsoil. The surface soil of Sioux loam is characterized by a very dark brown layer, 6 to 10 inches thick. This is underlain by a 6- to 12-inch layer of dark brown gravelly loam. At 18 inches or less, the substratum of yellowish-brown sands and gravels is encountered.

Use and Management. Areas of Sioux under cultivation are generally in close association with better soils such as Fordville. The shallower depth and excessive drainage of this soil make it extremely droughty during seasons of low rainfall.

The shallow depth also rules this soil out for irrigation purposes. It does not have sufficient water-holding capacity to be profitably irrigated. Because of its droughtiness this soil is best suited for the production of pasture and forages. When left without a cover of crop residues, Sioux loam is very susceptible to wind erosion.

FOURTH CLASS SOILS

(Pasture Land—Wet, Salty, Hilly or Stony)

The soils in this class are non-tillable because of excessive stoniness, steepness of slope, droughtiness, or poor drainage. They are best suited for controlled grazing of livestock, for wild life refuges, and for the production of perennial grasses for forage.

Benoit Loam and Silt Loam (Bt)

Benoit loam and silt loam occurs in very small delineations along drainage ways and streams. It is a poorly drained associate of the Fordville and Sioux soils. Only 326 acres of this soil have been separated out in the county.

Surface Soil and Subsoil. Benoit soils are characterized by a black surface soil which ranges from 8 to 12 inches in thickness. The subsoil is grayish-brown in color and lies over the substratum at depths ranging from 1 to 3 feet. The substratum consists of dirty gravels or stratified sands and gravels. This soil may or may not be calcareous from the surface down.

Use and Management. The poorly drained nature of this soil makes it suitable for pasture only. Benoit soils are also subject to flooding.

Buse Loam and Stony Loam (Bu)

These soils, most of which occur on steep slopes, occupy about 66,288 acres or almost 19.4 percent of Jerauld County. The steep slopes on which these soils are found, the large number of stones or large amount of gravel in the surface, and the relatively thin surface soil, make these soils unsuitable for cultivation. Steeply sloping to roughly broken valley sides, shallow soils on the uplands, and knobs or stringers of gravelly and stony materials are all included under Buse soils. The most pronounced area of Buse loam and stony loam mapped in Jerauld County is the crescent-shaped range of hills called "Wessington Hills," which traverse the county from north to south.

Surface Soil and Subsoil. The surface soil of Buse is 4 to 6 inches thick and

brownish-black in color. Below this is a thin transition layer which changes in color downward from a dark yellowish-brown to light yellowish-brown. This transition layer or subsoil is normally about 4 inches thick. Segregated lime or calcium carbonate, appearing as spots, streaks, or large masses can be seen in the subsoil. A light yellowish-brown, highly calcareous clay loam or gravelly loam glacial till underlies the subsoil. Igneous and quartz gravel and stone, and fragments of shale are scattered throughout the profile.

Use and Management. Cultivation is not practical on Buse soils. The steep slopes make these soils very susceptible to both sheet and gully erosion. A vegetative cover must be maintained on these soils if they are to be protected against further loss of soil. The recommended use for Buse loam and stony loam is as moderately restricted grazing land and hayland.

Jerauld Silty Clay Loam (J)

Jerauld silt loam and silty clay loam are included under this heading. Jerauld silty clay loam is developed in thin to moderately thick deposits of local alluvium from glacial drift overlying firm clay loam glacial till. An extremely heavy claypan development in the subsoil separates this soil from other soil types which have developed from the same materials.[2] Approximately 2,302 acres of Jerauld silty clay loam have been separated out in Jerauld County. Most of it occurs between Firesteel Creek and the breaks going up onto the Missouri Coteau.

Surface Soil and Subsoil. The surface soil is very dark gray to black in color, and ranges from 1 to 6 inches in depth. A dark grayish-brown heavy clay loam or claypan characterizes the subsoil. The subsoil may contain segregated lime in the lower portion. The underlying material consists of light brownish-gray to olive-brown, firm, calcareous glacial till or modified glacial drift that locally is like alluvial sediments.

Use and Management. Jerauld soil is being cultivated in some areas of the county, but it requires considerable power to work and crop yields are generally low. Both surface and internal drainage are poor and crops suffer from excess moisture in wet seasons and from drought in dry seasons. Because of poor internal drainage and claypan development, irrigation is not at all feasible on this soil. Small circular spots, where the claypan subsoil has been exposed, give this soil a scabby appearance. This soil may be used best as hay land or as pasture.

Although these soils occur on nearly level topography, wind erosion has been quite severe where attempts to cultivate the soil have been made.

Tetonka and Parnell Silt Loams and Silty Clay Loams (T P)

Tetonka and Parnell silt loams and silty clay loams are poorly drained soils of the uplands. They occupy the depressional areas which have no natural drainage outlets. These enclosed low spots account for about 10,769 acres in the county. These two soils have been mapped together and have not been separated. Tetonka and Parnell soils have developed in sediments washed down from the surrounding higher areas and redeposited in the depressions. There are several large areas of these soils in Jerauld County, but the major portion of these soil types occur in hundreds of small depressions scattered throughout the county.

[2]Claypan development in this soil is the result of a combination of restricted internal drainage and high soluble salt content.

Use and Management. Tetonka and Parnell soils are among the most difficult soils to handle. In the spring they are flooded. They dry out very slowly and may flood again in any season. Cultivation of these soils usually is not possible unless drainage is established. Even when drained, crops may be flooded out in the wetter years. Besides not being suitable for cultivation, these depressions restrict or hinder cultivation of the better soil types surrounding them. Where several depressions exist in a single field, detours around these wet spots are necessary for cultivation of the better soil. The best use of Tetonka and Parnell soils is for pasture or hay land. In wet years, sedges and rushes may crowd out the better grasses.

Tetonka Silt Loam and Silty Clay Loam (T)

Surface Soil and Subsoil. The surface soil of Tetonka is 8 to 16 inches thick and very dark gray in color. This grades into a light gray, soft to very friable layer ranging from 4 to 12 inches in thickness. The subsoil is a dark brown to black, silty clay loam, 10 to 30 inches in depth. This is underlain by a transition layer which is lighter in color. The substratum is light yellowish-brown to gray and contains free lime or calcium carbonate spots and streaks.

Parnell Silt Loam and Silty Clay Loam (P)

Surface Soil and Subsoil. The top soil of Parnell is a black silt loam or silty clay loam 8 to 16 inches thick. Beneath this is a dark gray clay subsoil 4 to 10 inches thick, with rust-brown iron stains. This layer may have free calcium carbonate present. The underlying material or substratum is gray to light olive-gray in color, with many colored streaks or spots scattered throughout. The colored streaks and spots in this calcareous clay substratum indicate that water has stood for long periods of time in this soil.

Rauville Silty Clay Loam (R)

Rauville silty clay loam is a first bottom or flood plain soil. It is the wettest soil on the stream bottom. It occurs in lower positions than Lamoure silty clay loam. Rauville is wet in the spring and early summer and the water table remains high throughout the year. This soil has developed from calcareous, fine-textured materials in stream bottoms over sandy, gravelly, silty or clayey stratified layers of water-reworked materials. About 2,286 acres of Rauville have been mapped in Jerauld County.

Surface Soil and Subsoil. The surface soil of Rauville is 6 to 15 inches deep and is black in color. This silty clay loam surface may have free calcium carbonate present. The subsoil of Rauville silty clay loam ranges in depth from 12 to 30 inches and grades from a dark gray, massive, silty clay loam to a massive, silty clay with depth. Stratified or water-laid sands, gravels and clays underlie the subsoil.

Use and Management. The poorly drained condition of this soil and its frequent flooding make it unsuitable for cultivation. Its use for pasture and hay land is largely limited to the dry seasons of years with below-average rainfall.

A summary of the acreage and proportionate extent of soils series and soil associations mapped in Jerauld County is shown in Table 10 in the Appendix.

Table 2. Estimated Yields of Major Grain Crops on the Soils of Jerauld County, South Dakota*

Soil Types	Crops and Estimated Yields Per Acre†					
	Corn	Wheat	Oats	Barley	Rye	Sorghum for grain
	Average management	Average management	Average management	Average management	Average management	Average management
	Bushels	Bushels	Bushels	Bushels	Bushels	Bushels
Aastad silt loam and loam	22	11	28	19	10	14
Barnes silt loam and loam	20	10	26	17	9	13
Benoit silt loam and loam	‡	----	----	----	----	----
Buse loam and stony loam	----	----	----	----	----	----
Fordville silt loam and loam	21	9	23	15	8	12
Gann silt loam	31	17	32	23	15	24
Jerauld silty clay loam	12	6	15	12	7	10
Kranzburg silty clay loam and silt loam	22	11	28	19	10	14
Lamoure silt loam	30	12	25	19	----	24
Lamoure silty clay loam	10	----	----	----	----	----
Lane silty clay loam	30	15	32	22	14	22
Lane clay (shale substratum)	17	9	24	15	8	16
Parnell silty clay loam and silt loam	----	----	----	----	----	----
Rauville silty clay loam	----	----	----	----	----	----
Tetonka silty clay loam and silt loam	----	----	----	----	----	----
Sioux loam	7	----	----	----	4	6
Waubay silty clay loam	23	12	30	20	12	15

*Estimated yield data in this report refer only to years of average or near average precipitation and will not hold true for periods of prolonged drought, such as the drought years of the 30's.

†With improved management, farmers can expect to increase their grain crops yields on these soils by: 3 to 8 bushels of corn, 3 to 6 bushels of wheat, 6 to 12 bushels of oats, 4 to 10 bushels of barley, 2 to 6 bushels of rye, and 4 to 10 bushels of sorghum for grain.

‡Indicates that the crop is not adapted, or is rarely grown.

Productivity of Soils in Jerauld County

The estimated average acre yields of major crops on the different soils of Jerauld County are shown in Tables 2, 3, 4 and 5. In the column under average management are the yields which may be expected under the management practices most commonly followed in the county. In the footnotes to the tables, yields under improved management indicate what may be expected as a result of better farming methods. Better farming methods include proper crop rotations, application of commercial fertilizers, weed control, good soil management, maintenance of organic matter through the use of crop residue, green manure and barnyard manure.

Most of the estimates for yields under average management are based on South Dakota Crop and Livestock Reporting Service, observations of local and state agricultural authorities, and other persons familiar with the area. Comparison of yields was also made between these soils and similar soils for which experimental data are available. The estimates for yields under improved management are based partly on experimental data obtained from the Agricultural Experiment Station at South Dakota State Col-

lege and partly on the soil scientists' and other soil and crop men's knowledge of the different soil series, and on field observations.

The figures given in the productivity tables may change in future years. Factors such as new crop varieties, new cultural and fertility practices, new plant diseases and insect pests, may cause increases or decreases in any of the crops listed in the table. Farmers in Jerauld County should keep this in mind when comparing their respective yields with those given in the tables when new factors occur which affect productivity.

Table 3. Estimated Yields of Hay on the Soils of Jerauld County, South Dakota*

Soil Types	Estimated Hay Yields in Tons per Acre†					
	Alfalfa	Sweet clover	Grain hay	Sorghum for forage	Other tame hay	Wild hay
	Average management	Average management	Average management	Average management	Average management	Average management
	Tons	Tons	Tons	Tons	Tons	Tons
Aastad silt loam and loam	2.0	1.2	1.0	2.0	1.3	----
Barnes silt loam and loam	1.7	1.1	.9	1.7	1.2	----
Benoit silt loam and loam	‡	----	----	----	----	.3
Buse loam and stony loam	.7	.7	----	----	.6	.4
Fordville silt loam and loam	1.5	.8	.8	1.4	.9	----
Gann silt loam	2.5	1.6	1.6	2.7	1.5	----
Jerauld silty clay loam	1.5	1.2	.6	1.4	1.0	.6
Kranzburg silty clay loam and silt loam	1.9	1.2	1.0	1.9	1.3	----
Lamoure silt loam	2.8	----	1.5	2.4	1.6	1.2
Lamoure silty clay loam	----	----	----	----	1.2	1.0
Lane silty clay loam	2.3	1.5	1.5	2.7	1.5	----
Lane clay (shale substratum)	1.9	1.3	.9	2.0	1.1	.7
Parnell silty clay loam and silt loam	----	----	----	----	1.5	.9
Rauville silty clay loam	----	----	----	----	----	.5
Tetonka silty clay loam and silt loam	----	----	----	----	1.5	.9
Sioux loam	.6	.4	----	.7	.3	.2
Waubay silty clay loam	2.1	1.2	1.2	2.1	1.4	----

*Estimated yield data refer only to years of average or near average precipitation and will not hold true for periods of prolonged drought, such as the drought years of the 30's.

†Under improved management farmers can expect to increase their hay yields on these soils by: 1/5 to 1 ton of alfalfa, 1/5 to 3/5 ton of sweet clover, ⅓ to ¾ ton of grain hay, sorghum or tame hay, and 1/10 to ⅓ ton wild hay per acre.

‡Indicates that the crop is not adapted, or is rarely grown.

Table 4. Estimated Yields of Special Crops on the Soils of Jerauld County, South Dakota*

Soil Types	Crops and Estimated Yields Per Acre†			
	Flax seed	Alfalfa seed	Sweet-clover seed	Potatoes
	Average management	Average management	Average management	Average management
	Bushels	Bushels	Bushels	Bushels
Aastad silt loam and loam	7	1.5	2.0	85
Barnes silt loam and loam	6	1.4	2.0	70
Benoit silt loam and loam	‡	.4	1.2	----
Buse loam and stony loam	----	.4	1.2	----
Fordville silt loam and loam	5	1.1	1.8	----
Gann silt loam	11	1.6	2.2	120
Jerauld silty clay loam	3	.7	1.0	----
Kranzburg silty clay loam and silt loam	7	1.4	2.0	80
Lamoure silt loam	----	1.5	----	----
Lamoure silty clay loam	----	----	----	----
Lane silty clay loam	10	1.5	2.1	110
Lane clay (shale substratum)	6	1.0	1.6	----
Parnell silty clay loam and silt loam	----	----	----	----
Rauville silty clay loam	----	----	----	----
Tetonka silty clay loam and silt loam	----	----	----	----
Sioux loam	----	.3	1.0	----
Waubay silty clay loam	7	1.6	2.0	90

*Estimated yield data refer only to years of average or near average precipitation and will not hold true for periods of prolonged drought, such as the drought years of the 30's.

†Under improved management flax yields may be increased 2 to 4 bushels per acre. Alfalfa and sweet clover seed 1/5 to 1 bushel per acre and potatoes 45 to 60 bushels per acre.

‡Indicates that the crop is not adapted, or is rarely grown.

Table 5. Estimated Yields of Pasture on the Soils of Jerauld County, South Dakota*

Soil Types	Types of Pasture and Estimated Yields in Animal Unit Months†			
	IMPROVED MANAGEMENT			Native grasses
	Alfalfa	Alfalfa or sweet clover-tame grass	Tame grasses‡	Unimproved management
	Rotational grazing	Rotational grazing		Permanent pasture
	A.U.M.†	A.U.M.	A.U.M.	A.U.M.
Aastad silt loam and loam	2.4	2.5	1.8	1.6
Barnes silt loam and loam	2.2	2.2	1.7	1.4
Benoit silt loam and loam	—§	—	—	.6
Buse loam and stony loam	1.0	1.1	.9	.7
Fordville silt loam and loam	1.8	1.9	1.3	1.0
Gann silt loam	2.9	3.1	2.2	1.7
Jerauld silty clay loam	1.4	1.5	1.2	.9
Kranzburg silty clay loam and silt loam	2.3	2.3	1.8	1.5
Lamoure silt loam	3.0	3.2	2.5	2.1
Lamoure silty clay loam	—	—	2.0	1.4
Lane silty clay loam	2.8	2.9	2.1	1.6
Lane clay (shale substratum)	2.0	2.2	1.3	1.0
Parnell silty clay loam and silt loam	—	—	2.0	1.3
Rauville silty clay loam	—	—	—	.6
Tetonka silty clay loam and silt loam	—	—	2.0	1.3
Sioux loam	.8	.8	.6	.4
Waubay silty clay loam	2.5	2.6	1.9	1.6

*Estimated yield data refer only to years of average or near average precipitation and will not hold true for periods of prolonged drought, such as the drought years of the 30's.

†A.U.M.—Animal Unit Months: The number of months one acre will support one cow (beef) during the grazing season: The number of acres required to supply seasonal pasture for one animal unit on a particular soil type may be secured by dividing the A.U.M. figures given above into the number 6.

‡Tame grasses recommended for Jerauld County include bromegrass, crested wheatgrass, and Ree wheatgrass.

§Indicates the crop is not adapted or is rarely grown.

Geology and Physiography

The Wessington Hills, in the western part of Jerauld County are a part of the Missouri Coteau, an ancient plateau that has been made hilly by erosion and modified by glacial action. The eastern half of the county lies within the prairie plains of the James river valley. Both areas are underlain by Pierre shale bedrock. Glacial drift covers the entire county. The unsorted materials left by the ice sheets are called glacial till.

Two separate substages of the "Wisconsin ice sheet" left a clear record in the county. The Cary substage covered the entire county. Later a second substage of the Wisconsin glaciation, called the Mankato, moved across the eastern section of the county as far west as the Wessington Hills. These hills are believed to be the end moraine of this ice sheet. The Mankato glacial till is characterized by poorly developed surface drainage and heavier textured till, with a higher content of shale than the Cary glacial till.

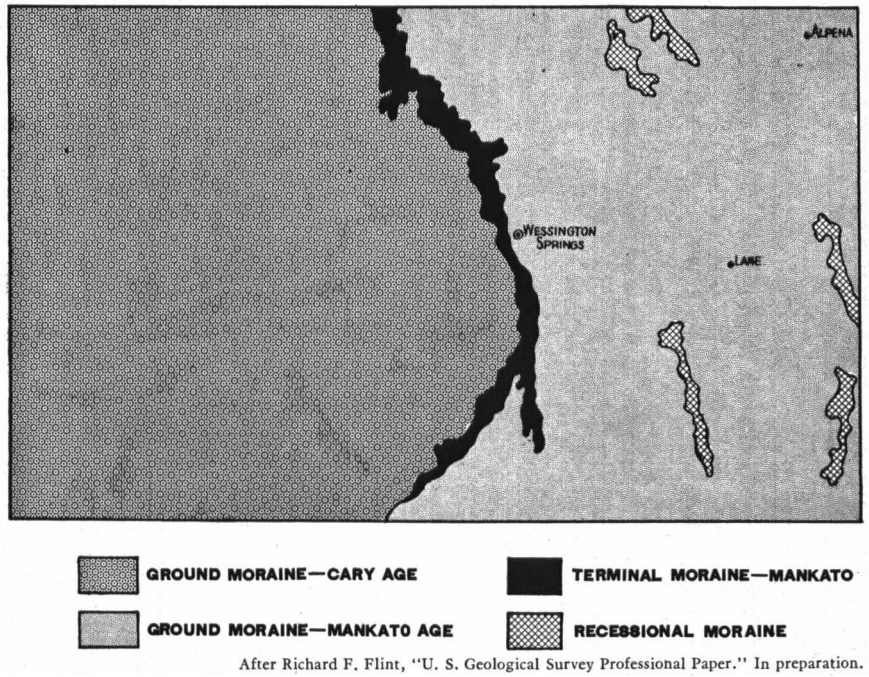
The Wessington Hills are the most distinctive physiographic feature of Jerauld County. They form the western limit of the James river lowland. The hills rise abruptly to heights of 200 feet in a distance of one-half to several miles. These hills are subject to erosion and many small streams have extended their head waters into them.

East of the Wessington Hills, the topography of the county is typically that of a ground moraine, the surface being generally level to undulating. Two partially subdued recessional moraines are included in the James river lowland. They occur in Dale and Franklin townships just inside the county line. The drainage system is not well developed. The streams have few tributaries and many closed depressions are apparent. These morainic depressions all have water in them during the early spring. In normal seasons, many drain early enough to be cultivated.

The Missouri Coteau west of the Wessington Hills is more rolling than the James river lowland. The drainage system is much better developed. Enclosed depressions are not so prevalent and the drainage systems are deeply entrenched and have higher stream-terrace levels. Much of the more smooth and undulating areas of the Coteau have been modified by a blanket-like deposit of wind-laid fine materials called loess. The thickness of this blanket of loess is quite variable and is entirely absent in some areas.

The soils in Jerauld County may be grouped on the basis of topographic position under three main headings: soils of the upland, terrace soils, and bottomland soils.

Upland soils are those which occupy the higher areas of ground moraine and steeper valley slopes (Fig. 10). They consist of two general types: soils which have been derived from the weathering



After Richard F. Flint, "U. S. Geological Survey Professional Paper." In preparation.

Fig. 10. The terminal moraine through the center of the county is believed to be the end moraine of the Mankato ice sheet.

of glacial drift, and the less extensive loess soils. These soils have remained largely where they were formed except for some erosion. They are generally well-drained and of medium textures.

Terrace soils are those which occupy the river benches or the second and third bottoms as they are sometimes called. The materials from which these soils have been developed have been derived chiefly from water-laid glacial drift and from post-glacial deposits washed down from the uplands as alluvium and colluvium. These soils are usually well above the present stream level and lie on comparatively flat areas.

The bottomland soils occupy the flood plains or the first bottoms of the stream valleys. These soils are composed of more recent materials washed down from the terraces and uplands and deposited during periods of high water. The water table is normally high, and as a rule these soils are poorly drained.

Appendix

Table 6. Last Killing Frost in the Spring, First Killing Frost in the Fall and Annual Precipitation for Jerauld County, South Dakota

Year	*Killing Frosts		*Annual precipitation in inches
	Last in the spring	First in the fall	
1940	----------	October 17	
1941	April 31	September 28	20.06
1942	----------	September 24	29.81
1943	May 13	October 15	16.19
1944	May 5	----------	29.06
1945	May 8	September 29	20.23
1946	June 2	September 29	27.94
1947	May 29	September 22	17.54
1948	May 6	October 17	21.46
1949	----------	October 21	17.28

Other temperature and precipitation data taken from a 35-year record at the Gann Valley Weather Station

Temperature		Precipitation in inches	
January average	16.0 °F	Winter average	1.69
July average	76.1 °F	Spring average	5.71
Maximum	120.0 °F	Summer average	8.76
Minimum	–42.0 °F	Fall average	3.21
		Total	19.37

*Taken from Wessington Springs Weather Station

Table 7. A Classification of Soil Series in Jerauld County, South Dakota According to Parent Materials, Relief, Drainage, Drought Resistance and Erosion Hazard

Soil series	Parent material	Relief	Drainage		Drouth resistance	Erosion hazard
			Surface	Internal		
Barnes	Glacial till	Undulating	Moderate	Moderate	Good	Moderate
Aastad	(Mixed boulders,	Level	Moderate-slow	Moderate	Good	Slight
Buse	sands, silts and	Rolling	Very rapid	Moderate	Poor	Severe
Parnell	clays)	Depressional	Ponded	Very slow	Good	None
Tetonka		Depressional	Ponded	Very slow	Good	None
Kranzburg	Loess (Wind-blown silty materials) over glacial till	Undulating	Moderate	Moderate	Good	Moderate
Benoit	Glacial outwash	Nearly level	Slow	Very slow	Good	Slight
Fordville	(Sands and gravel)	Nearly level	Moderate-slow	Moderate-rapid	Fair	Moderate
Sioux		Nearly level	Moderate-slow	Rapid	Poor	Moderate
Gann	Colluvial-alluvial	Gently sloping	Moderate	Moderate	Good	Severe*
Lane	deposits at the base	Gently sloping	Moderate	Moderate	Good	Severe*
Jerauld	of steeper slopes	Nearly level	Moderate-slow	Slow	Poor	Moderate
Lamoure	Recent alluvium	Level	Very slow	Very slow	Good	None
Rauville	(Water-deposited sediments)	Level	Very slow	Very slow	Good	None

*Subject to gully erosion

Table 8. Index of Soils and Soils Associations of Jerauld County According to Restrictions Upon Land Use

Name	Lay of Land	Map Symbol
Good land, subject to moderate limitations		
Barnes silt loam and loam	Undulating	B and Bl
Barnes and Aastad silt loams and loams	Level to undulating	Bl Al
Barnes silt loam and Kranzburg silty clay loam	Undulating	B K
Barnes silt loam and Kranzburg and Waubay silty clay loam	Level to undulating	B K W
Gann silt loam	Level to sloping	G
Kranzburg silty clay loam	Undulating	K
Kranzburg and Waubay silty clay loam	Level to undulating	K W
Lane silty clay loam	Level to sloping	Ln
Fair land, subject to severe limitations		
Barnes silt loam and loam	Rolling	B and Bl
Barnes silt loam and Kranzburg silty clay loam	Rolling	B K
Fordville silt loam and loam	Level to slightly undulating	F
Fordville and Kranzburg silt loams and loams	Level to slightly undulating	F K
Lamoure silt loam	Level	L
Lane clay (shale substratum)	Level to sloping	Lc
Poor land, subject to severe limitations and suitable only for occasional cultivation		
Lane-Jerauld silty clay loam	Level to gently sloping	Ln J
Tetonka and Parnell silt loams and silty clay loams	Depressional	T P
Land not suited for cultivation because of wetness and flooding hazard		
Benoit silt loam and loam	Level	Bt
Lamoure silty clay loam	Level	La
Land suited only for grazing or permanent hay		
Jerauld silty clay loam	Level or nearly level	J
Jerauld-Lane silty clay loam	Level or nearly level	J Ln
Sioux and Fordville loams	Level to sloping	S F
Land suited for limited or controlled grazing		
Buse loam and stony loam	Rolling to steep	Bu
Land suited for watersheds and wildlife		
Rauville silty clay loam	Level to depressional	R

Table 9. Index of Soils and Soil Associations of Jerauld County According to Suitability for Irrigation

Name	Lay of Land	Map Symbol
Soils which may be suitable		
Barnes silt loam and loam	Undulating	B and Bl
Fordville silt loam and loam	Level to slightly undulating	F
Gann silt loam	Level to sloping	G
Soils which are doubtful (may or may not be suitable)		
Barnes and Aastad silt loams and loams	Level to undulating	Bl Al
Barnes silt loam and Kranzburg silty clay loam	Undulating to rolling	B K
Barnes silt loam and Kranzburg and Waubay silty clay loam	Level to undulating	B K W
Fordville and Kranzburg silt loams and loams	Level to slightly undulating	F K
Kranzburg silty clay loam	Undulating	K
Kranzburg and Waubay silty clay loam	Level to slightly undulating	K W
Lane silty clay loam	Level to sloping	Ln
Soils which are not suitable		
Barnes silt loam and loam	Rolling	B and Bl
Barnes silt loam and Kranzburg silty clay loam	Rolling	B K
Benoit silt loam and loam	Level	Bt
Buse loam and stony loam	Rolling to steep	Bu
Jerauld silty clay loam	Level or nearly level	J
Jerauld-Lane silty clay loam	Level or nearly level	J Ln
Lamoure silt loam	Level	L
Lamoure silty clay loam	Level	La
Lane clay (shale substratum)	Level to sloping	Lc
Lane-Jerauld silty clay loam	Level to gently sloping	Ln J
Rauville silty clay loam	Level to depressional	R
Sioux and Fordville loams	Level to sloping	S F
Tetonka and Parnell silty clay loam and silt loam	Depressional	T P

Table 10. Acreage and Proportionate Extent of Soil Series and Soil Associations Mapped in Jerauld County, South Dakota

Soil series and associations*	Acres	Percent of county
Barnes silt loam and loam	98,751	28.9
Barnes and Aastad silt loams and loams	32,135	9.4
Barnes silt loam and Kranzburg silty clay loam	14,139	4.1
Barnes silt loam and Kranzburg and Waubay silty clay loams	36,121	10.6
Benoit loam and silt loam	326	0.1
Buse loam and stony loam	66,288	19.4
Fordville loam and silt loam	6,005	1.8
Fordville and Kranzburg loams and silt loams	3,295	1.0
Gann silt loam	3,353	1.0
Jerauld silty clay loam	2,302	0.7
Jerauld-Lane silty clay loams	3,376	1.0
Kranzburg silty clay loam	1,653	0.5
Kranzburg and Waubay silty clay loams	1,743	0.5
Lamoure silt loam	8,037	2.4
Lamoure silty clay loam	12,255	3.6
Lane silty clay loam	19,006	5.6
Lane clay (shale substratum)	438	0.1
Lane-Jerauld silty clay loams	11,760	3.4
Rauville silty clay loam	2,286	0.7
Sioux and Fordville loams	5,538	1.6
Tetonka and Parnell silt loams and silty clay loams	10,769	3.1
Miscellaneous Lakes, Dams, Gravel Pits, Towns, Roads, etc	1,820	0.5
Total	341,402	100.0

*Where two or more soils occur in an association, the soil types are arranged so that the most prominent soil or soils occur first in the series.

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T 107 N

T 106N

WESSINGTON SPRINGS

ALPENA

LANE

CROW LAKE

Soil Association Map of
JERAULD COUNTY
South Dakota

Soil Association Map of Jerauld County

Scale — 1 inch equals 1 mile

Agronomy Department, South Dakota State College, Brookings
In Cooperation with the Soil Conservation Service and the Bureau of Plant Industry, Soils and Agricultural Engineering, U.S.D.A.

JERAULD COUNTY LEGEND

- B — Barnes Loam and Silt Loam
- Bl — Barnes Loam
- BA — Barnes-Aastad Loams and Silt Loams
- BlAl — Barnes-Aastad Loams
- BK — Barnes Silt Loam and Kranzburg Silty Clay Loam
- BKW — Barnes Silt Loam and Kranzburg-Waubay Silty Clay Loams
- K — Kranzburg Silty Clay Loam
- KW — Kranzburg-Waubay Silty Clay Loams
- G — Gann Silt Loam
- Ln — Lane Silty Clay Loam
- Lc — Lane Clay, Shale Substratum
- LJ — Lane-Jerauld Silty Clay Loams
- JL — Jerauld-Lane Silty Clay Loams
- J — Jerauld Silty Clay Loam
- F — Fordville Loam and Silt Loam
- FK — Fordville-Kranzburg Loams and Silt Loams
- Bu — Buse Loam and Stony Loam
- SF — Sioux-Fordville Loams
- TP — Tetonka-Parnell Silt Loams and Silty Clay Loams
- Bt — Benoit Loam and Silt Loam
- L — Lamoure Silt Loam
- La — Lamoure Silty Clay Loam
- R — Rauville Silty Clay Loam

To save space, abbreviations of soil types and associations have been used on the soil maps. The first letter or letters in front of the number in the mapping symbol indicates what soil or soils are found within that soil boundary. In many of the small Tetonka and Parnell soil areas only the soil symbol has been placed on the map. These areas are level or nearly level and there has been no erosion.

The numbers between the letters inside of the soil boundaries indicate the degree of erosion.

The letter or letters following the numbers indicate the slope.

The example below will show you how to interpret the mapping symbols shown on the soil map:

B2B= | B — Barnes Soil | 2 — Moderate Erosion | B — 3–6% Slope

Erosion has been classified as:

Slight	1
Moderate	2
Severe	3

Slope groups have been classified as:

A	0– 3%
B	3– 6%
BB	6– 9%
C	9–18%
D	18% plus

CONVENTIONAL SIGNS

- County Boundary
- Hard Surface Road
- Gravel Road
- Dirt Road
- Trail
- Section Line
- Railroad
- Intermittent Stream
- Lakes
- Intermittent Lakes
- Soil Boundary
- Wet Spots